Elastic scattering of π⁻ mesons ...   S/056/62/042/006/047/047
                                          B104/B112

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow
               Engineering Physics Institute)

SUBMITTED: April 23, 1962

Card 2/2

ALEKSANYAN, A.S.; ALIKHANYAN, A.I.; VEREMEYEV, M.M.; GAL'PER, A.M.;
    KIRILLOV-UGRYUMOV, V.G.; KOTENKO, L.P.; KUZIN, L.A.; KUZNETSOV, Ye.P.;
MERZON, G.--.

Freon 570 liter bubble chamber. Prib. i tekh.eksp. 6 no.6:34-
38 N-D '61.   (MIRA 14:11)

1. Fizicheskiy institut AN SSSR.
                        (Bubble chamber)

S/823/62/000/000/003/007
B125/B102

24.7600

AUTHORS: Kirillov-Ugryumov, V. G., Petrukhin, A. A., Prokhorova, L. A., Rozental', I. L.

TITLE: Evaluation of the possibility of using cosmic rays for examining the muon structure

SOURCE: Nekotoryye voprosy fiziki elementarnykh chastits i atomnogo yadra. Ed. by V. D. Mikhaylov and I. L. Rozenta.'. Mosk. inzh.-fiz. inst. Moscow, Gosatomizdat, 1962, 77-82

TEXT: The nature of electromagnetic interaction at distances of $\sim 10^{-13}$ cm may perhaps be revealed by investigating the muon-electron scattering at electron energies of 10-100 Bev. Cosmic radiation is suggested as a source of high-energy muons. Table 1 contains the probabilities

$$w(E) = \int_{E_{0\,\text{мин}}}^{\infty} \frac{2Cm}{E^2}\left[1 - \frac{E}{E_{\text{макс}}} + \frac{1}{2}\left(\frac{E}{E_0}\right)^2\right]\frac{(\gamma-1)\cdot E_k^{\gamma-1}}{(E_k+E_0)^\gamma}\,dE_0, \quad (8)$$

Card 1/3

Evaluation of the possibility...   S/823/62/000/000/003/007
B125/B102

and (8) can be reduced to $w(E) = (Cm/E^2)(E_k/E_{o\ min})^{\gamma-1}$, where $C = 0.15\ Z/A$.
There are 2 tables.

$E,\ Бэв$	$w\ (E)$	$W\ (E)$	$\bar{P}_\perp,\ Мэв/с$
10	$1,5 \cdot 10^{-9}$		
20	$0,183 \cdot 10^{-9}$	$7,91 \cdot 10^{-8}$	80
30	$0,0518 \cdot 10^{-9}$	$1,61 \cdot 10^{-8}$	110
40	$0,0211 \cdot 10^{-9}$	$0,63 \cdot 10^{-8}$	130
50	$0,0103 \cdot 10^{-9}$	$0,333 \cdot 10^{-8}$	140
70	$0,0035 \cdot 10^{-9}$	$0,2 \cdot 10^{-8}$	160
100	$0,0011 \cdot 10^{-9}$	$0,09 \cdot 10^{-8}$	190
		$0,039 \cdot 10^{-8}$	220

Таблица 1

Table 1

Card 3/3

KIRILLOV-UGRYUMOV, V. G.   95

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo
             instituta (Scientific Conference of the Moscow Engineering
             Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400
delegates participating. A review is given of these lectures that are
assumed to be of interest for the readers of Atomnaya energiya. They are
following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev,
design of accelerators for superhigh energies; I. Ya. Pomeranchuk,
analyticity, unitarity, and asymptotic behavior of strong interactions at
high energies; A. B. Migdal, phenomenological theory for the many-body
problem; Yu. D. Piveyskiy, deceleration of medium-energy antiprotons in
matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect;
M. I. Ryasanov, theory of ionisation losses in nonhomogeneous medium;
Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of subcritical plasma;

Card 1/4

36

S/089/62/013/006/019/027
B102/B186

Nauchnaya konferentsiya...

Ye. Ye. Lovetskiy, A. A. Rukhadze, electromagnetic waves in nonhomogeneous plasma; Yu. D. Kotov, I. L. Rozental', the origin of fast cosmic muons; Yu. M. Ivanov, muon depolarization in solids; V. G. Varlamov, Yu. M. Grashin, B. A. Dolgoshein, V. G. Kirillov-Ugryumov, V. S. Roganov, A. V. Samoylov, μ^- capture by various nuclei; V. S. Demidov, V. G. Kirillov-Ugryumov, A. K. Ponosov, V. P. Protasov, F. M. Sergeyev, scattering of π^- mesons at 5 - 15 Mev in a propane bubble chamber; S. Ya. Nikitin, M. S. Aynutdinov, Ya. M. Selektor, S. M. Zombkovskiy, A. F. Grashin, muon production in $\pi^- p$ interactions; B. A. Dolgoshein, spark chambers; N. G. Volkov, V. K. Lyapidevskiy, I. M. Obodovskiy, study of operation of a convection chamber; K. G. Finogenov, production of square voltage pulses of high amplitudes; G. N. Aleksakov, problems of color vision; V. K. Lyapidevskiy, relation between number of receivers and number of independent colors; Ye. M. Kudryavtsev, K. K. Sobolev, N. I. Tizengausen, L. N. Tunitskiy, F. S. Faysulov, determination of the moment of electron transition of os-cillator forces and the widths of the Schuhman-Runge bands of molecular oxygen; B. Ye. Gavrilov, A. V. Zharikov, V. I. Rayko, decomposition of the volume charge of intense ion beams; Ye. A. Kramer-Ageyev, V. S. Troshin, measurement of neutron spectra; G. G. Doroshenko, new methods of fast-neutron recording; V. I. Ivanov, dosimetry terminology; R. M. Voronkov,

Card 2/4

DEMIDOV, V.S.; KIRILLOV-UGRYUMOV, V.G.; PONOSOV, A.K.; PROTASOV, V.P.;
    SERGEYEV, F.M.

    Elastic scattering of 5-15 Mev. π-mesons on carbon nuclei.
    Zhur. eksp. i teor. fiz. 42 no.6:1687-1688 Je '62. (MIRA 15:9)

    1. Moskovskiy inzhenerno-fizicheskiy institut.
                    (Mesons--Scattering)
                        (Carbon)

ACCESSION NR: AP3007719   S/0120/63/000/003/0055/0057

AUTHOR: Bobrov, V. D.; Varlamov, V. G.; Grashin, Yu. M.; Dolgoshein, B. A.; Kirillov-Ugryumov, V. G.; Roganov, V. S.; Samoylov, A. V.

TITLE: Use of threshold Cerenkov counter for separation of μ- and π-mesons in meson beams

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1963, 55-57

TOPIC TAGS: μ-meson separation, threshold Cerenkov counter

ABSTRACT: A Cerenkov counter has been used for the separation of μ- and π-mesons. The counter consists of a 100-mm cube of polished organic glass 2 mm thick filled with distilled water containing 2-aminonaphthalene-6, 8-disulfonic acid, which serves as the spectrum transformer. This cube is placed inside another cube with walls 2 mm thick. The space of 3 mm between the cubes is filled with MgO powder. Two FEU-33 photomultipliers connected to a common load are in optical contact with the water radiator. The radiator

Card 1/3

ACCESSION NR: AP3002719

and the photomultiplier are enclosed in a steel casing with foil windows for particle passage. A block diagram of the arrangement is shown in Fig. 1 of the Enclosure. A 260-Mev/sec pulsed meson beam was used in experiment. Resolution time of the coincidence circuits is 5—8 nanosec., and the efficiency of anticoincidence, 99.03%. It was found that the use of the Cerenkov counter makes it possible to reduce the contents of π-mesons in a μ-meson beam by a factor of 10. Orig. art. has 3 figures.

ASSOCIATION: none

SUBMITTED: 25Jun62   DATE ACQ: 12Jul63   ENCL: 01

SUB CODE: 00   NO REF SOV: 001   OTHER: 001

Card 2/3

ACCESSION NR: AP3002719

ENCLOSURE: 01

Fig. 1. Location of counters and block diagram of electronic circuit

Pb — 70 x 70 mm lead collimator; C_1 and C_3 — scintillation counters with Φ 100 x 10 mm plastic scintillators; C_4 — Φ 80 x 3 mm; C_2 — Φ 200 x 10 mm; C_2 — Cerenkov counter; F_1 and F_2 — variable thickness filters; Mo — 3 gr/cm^2 carbon target; A_1 through A_3 — amplifiers with gain of 5; 3 — variable delay lines; CO — coincidence and anticoincidence circuits; C — coincidence inputs; AC — anticoincidence inputs; M — coincidence monitoring circuit; SC — scaler circuit.

Card 3/3

S/056/63/044/004/004/044
B102/B186

AUTHORS: Demidov, V. S., Kirillov-Ugryumov, V. G., Ponosov, A. K.,
            Protasov, V. P., Sergeyev, F. M.

TITLE: Absorption of stopped negative pions in carbon

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,
             no. 4, 1963, 1144 - 1146

TEXT: Previously taken photographs (ZhETF, 42, 1689, 1962) of interactions
of slow π^- in a 4-liter propane bubble chamber were now used to investigate
the pion absorption by carbon nuclei. Among 3500 π^- stops there were 1130
selected for an analysis of the pion star distribution with respect to
prongs, and 1180 two-pronged stars for investigating the distribution with
respect to the angle between the prongs. If one assumes (Phys. Rev. 84,
258, 1951) that π^- are absorbed only by nucleon pairs (pn, pp), the ab-
sorption probability may be calculated. On comparing the experimental
results with those calculated by the method of least squares, the π^- ab-
sorption probability by a pn-pair amounts to 70 - 80%, that for a pp-pair
to 30 - 20%, and the probability of an intranuclear collision is 60 - 80%.

Card 1/2

Absorption of stopped negatives.

8/056/63/044/004/004/044
B102/B186

The mean number of prongs was found to be 0.84 and the distribution of stars with respect to the angle between the prongs had a sharp maximum at about 180°. The results speak in favor of the two-nucleon absorption mechanism. The absorption probability is energy-independent in the range 0 - ~200 Mev. There are 1 figure and 1 table.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute of Physical Engineering)

SUBMITTED: November 2, 1962

Card 2/2

DEMIDOV, V.S.; ZHIZHIN, Ye.D.; KIRILLOV-UGRYUMOV, V.G.; PONOSOV, A.K.;
SERGEYEV, F.M.; SHALAMOV, Ya.Ya.

Effect of the nucleus on γ^0-meson production. Zhur. eksp. i
teor. fiz. 45 no.3:437-442 S '63.   (MIRA 16:10)

1. Institut teoreticheskoy i eksperimental'noy fiziki i
Moskovskiy inzhenerno-fizicheskiy institut.
          (Mesons)   (Collisions (Nuclear physics)

ACCESSION NR: AP4031142   S/0056/64/0046/004/1220/1225

AUTHORS: Demidov, V. S.; Verebryusov, V. S.; Kirillov-Ugryumov, V. G.; Ponosov, A. K.; Sergeyev, F. N.

TITLE: Absorption of negative pions stopped in propane

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1220-1225

TOPIC TAGS: pion absorption by carbon, two nucleon model, many nucleon model, nuclear structure, bubble chamber, propane bubble chamber, secondary particle angular distribution, secondary particle energy spectrum, np pair absorption, pp pair absorption

ABSTRACT: To compare the effectiveness of pion absorption in carbon by the two-nucleon mechanism against the effectiveness of other possible mechanisms, a four-liter propane bubble chamber was used to obtain the energy spectra of the secondary singly-charged particles resulting from the absorption of slowing-down pions by carbon and to

Card 1/3

ACCESSION NR: AP4031142

obtain the distributions with respect to the angle between the prongs of the pion stars. Bubble-chamber photographs from an earlier investigation of the scattering of low-energy pions (ZhETF v. 42, 1687, 1962) were used as the source material. The estimates based on the energy spectra show that the maximum possible contribution of pion absorption by a complex of several nucleons ($\geq$ 4) does not exceed 20%. A Monte Carlo electronic-computer analysis of more than 2000 interactions has shown that the experimental data agree with the two-nucleon mechanism, and that the probability of absorption of the pion by an np pair is two or three times larger than the probability of absorption by a pp pair; the latter agrees with the author's earlier results (ZhETF v. 44, 1144, 1963). "In conclusion, the authors are indebted to Professor A. I. Alikhanyan and L. B. Kotenko, whose efforts made this experiment possible, to V. P. Protasov who participated in the early stage of the work, to E. A. Savina and M. G. Gornov for help with the measurements, and to the entire mathematics group of Institut teoreticheskoy i eksperimen-

Card 2/3

ACCESSION NR: AP4031142

tal'noy fiziki (Institute of Theoretical and Experimental Physics) for the laborious calculations." Orig. art. has: 7 figures and 3 tables.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering Physics Institute)

SUBMITTED: 25Oct63   DATE ACQ: 07May64   ENCL: 00

SUB CODE: PH   NO REF SOV: 012   OTHER: 005

Card 3/3

ACCESSION NR: AP4031191   S/0056/64/046/004/1504/1507

AUTHOR: Aleksanyan, A. S.; Alikhanyan, A. I.; Gal'per, A. M.; Kavalov, R. L.;
Kirillov-Ugryumov, V. G.; Kotenko, L. P.; Kuzin, L. A.; Kuznetsov, Ye. P.; Merzon,
G. I.

TITLE: Study of decays of K_2^0 mesons into three neutral pions

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1504-1507

TOPIC TAGS: neutral kaon decay, electron positron pair, kaon three pion decay,
inelastic neutron interaction

ABSTRACT: This is an ellaboration of an earlier preliminary report (Sb. Voprosy*
fiziki elementarny*kh chastits. Izd. AN ArmSSR, Yerevan, 1963, p. 324). Some
50,000 stereo photographs were taken and the events classified as K^0-meson decay
were those with 3, 4, 5, or 6 electron-positron pairs directed approximately to-
wards one point, and also V-events. The measure of the convergence of the γ quanta
producing the pairs was the maximum distance h from the point of intersection of
the trajectories of the two nearest γ quanta to the trajectories of the other γ
quanta. Comparison of the histograms corresponding to different numbers of prongs
indicates that there exist definite physical reasons which lead to the appearance

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ACCESSION NR: AP4031191

of three or more electron-positron pairs whose vertices are directed approximately towards one point. The calculated probability for the $K_2^0 \to 3\pi^0$ decay relative to all K_2^0 meson decay is 0.2 ± 0.06. This agrees with theoretical predictions (23.6%) obtained by assuming the validity of the $\Delta T = 1/2$ rule. "The authors are grateful to E. O. Okonov for a discussion of several problems during the planning of the experiment, to Academician V. I. Veksler, I. V. Chuvilo, and the proton synchrotron crew for making the irradiation possible, and also to I. B. Vartazaryan, L. P. Kishinevskaya, N. V. Magradze, and the laboratory group for help in the reduction of the experimental material. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR); Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering Physics Institute); Fizicheskiy institut GKAE, Yerevan (Physics Institute GKAE)

SUBMITTED: 25Jan64   DATE ACQ: 07May64   ENCL: 01

SUB CODE: NP   NR REF SOV: 004   OTHER: 001

Card 2/3

ACCESSION NR: AP4031191

			1	2		
1	2					4
Вид события с электронно-позитронными парами	$N_{полн}$ h < 1,3 см	Число событий, появившихся в результате различных процессов, включая распады $K_2^0 \to 3\pi^0$				Число распадов $K_2^0 \to 3\pi^0$
		5 $N_{случ}$	$N(K_2^0 \to 3\pi^0)$	$N_{яд}$ 6		
Six Five Four Three	1* 8 28 157	0 2 8 46	0 0 3 17	0 0 0 8	1 6 17 86	
Сумма Sum	194	56	20	8	110	

*Convergence parameter h = 2.1 cm.

1 - Number of electron positron pairs in event
2 - N_{total}, 3 - Number of events resulting from processes other than $K_2^0 \to 3\pi^0$ decays, 4 - Number of $K_2^0 \to 3\pi^0$ decays,
5 - number of random events, 6 - number of nuclear interactions

Card 3/3

L 2769-66   EWT(m)   IJP(c)

ACCESSION NR: AP5021331   UR/0120/65/000/004/0059/0062
                                           539.1.074.2

AUTHOR: Kirillov-Ugryumov, V. G.; Petrukhin, A. A.; Shestakov, V. V.

TITLE: The study of certain characteristics of the IK-6 ionization chamber

SOURCE: Pribory i tekhnika eksperimenta, no. 4, 1965, 59-62

TOPIC TAGS: ionization chamber, ion distribution, alpha particle

ABSTRACT: This paper presents the results of investigations of the IK-6 110x54 mm², 3 meter ionization chamber. The investigations cover the potential distribution across the cross section of the chamber, the calculated coefficients of electron collection at various parts of the chamber, and the calculated electron collection times. Using α particles from Pu²³⁹ samples, the authors verified experimentally (at 0.5 atm of pure and commerical argon) the effectiveness of corner operation and the electron collection time (as a function of applied voltages). Pulse oscillograms are shown in Fig. 1 of the Enclosure. "The authors thank V. V. Borog, I. A. Danil'chenko, and V. G. Sinitsyna for the help during individual measurements and N. L. Grigorov for valuable remarks." Orig. art. has: 4 formulas, 5 figures, and 2 tables.

Card 1/3

L 2769-66

ACCESSION NR: AP5021331

ASSOCIATION: Moskovskiy inshenerno-fizicheskiy institut (Moscow Engineering Physics Institute)

SUBMITTED: 30Nov64   ENCL: 01   SUB CODE: NP

NO REF SOV: 005   OTHER: 004

Card   2/3

L 2769-66
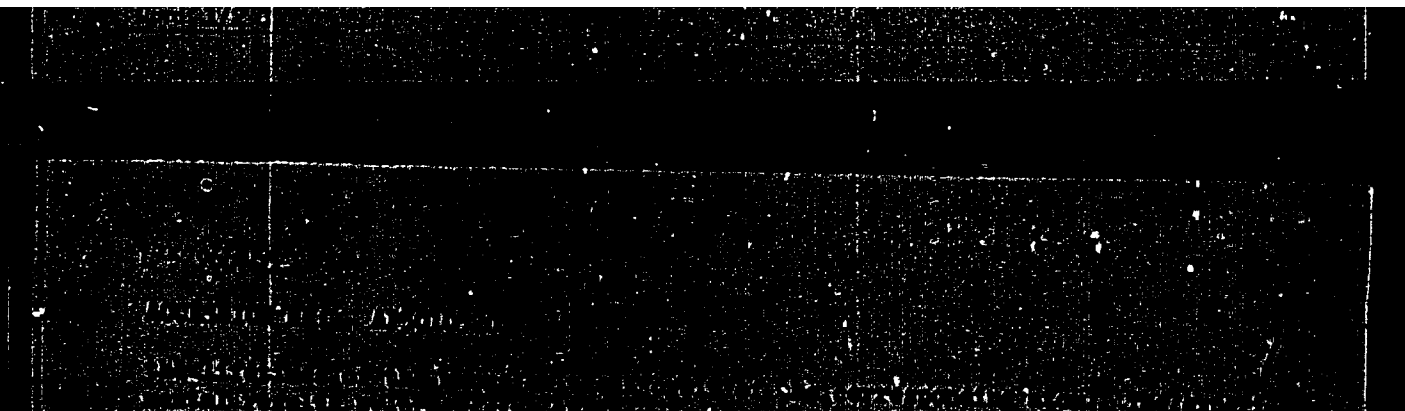ACCESSION NR: AP5021331   ENCLOSURE: 01

Figure 1. Pulse oscillograms
a - pure argon; 6 - commerical argon. Marks every 5 µsec.

Card 3/3
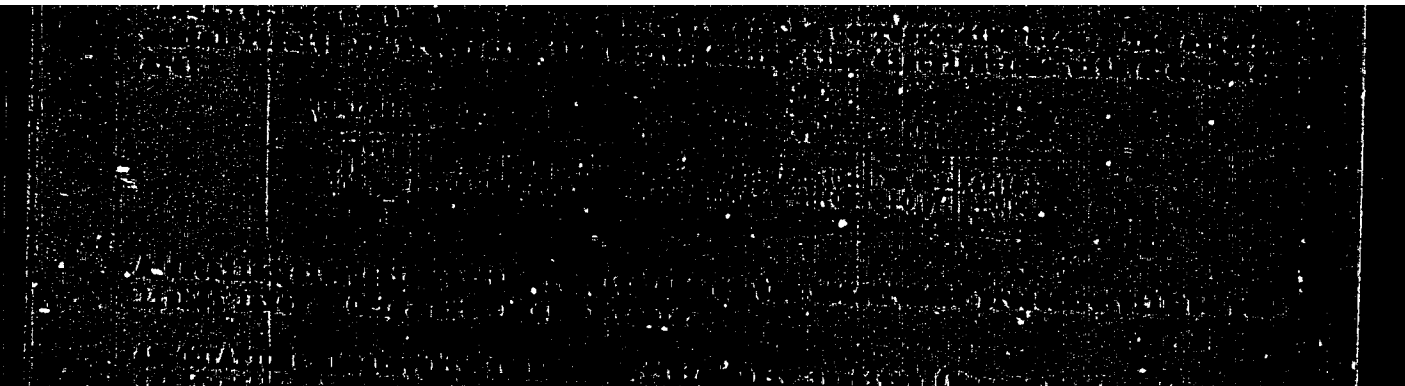
L 00347-67   EWT(m)   GD

ACC NR: AT6032306   SOURCE CODE: UR/0000/66/000/000/0059/0068

AUTHOR: Borog, V. V.; Kirillov-Ugryumov, V. G.; Petrukhin, A. A.; Rozental', I. L.;
Shestakov, V. V.

ORG: none

TITLE: Ionization calorimeter for the investigation of high energy cosmic muons at
large zenith angles

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Fizika elementarnykh chastits (Phy-
sics of elementary particles). Moscow, Atomizdat, 1966, 59-68

TOPIC TAGS: muon, calorimeter, bremsstrahlung, cosmic ray measurement, angular dis-
tribution, ionization chamber, waveguide

ABSTRACT: A study of high energy muons, using the horizontal flux zenith angles $\geq 60°$
of cosmic rays at sea level was made and an ionization calorimeter developed for this
purpose is described. Such a study is feasible because the horizontal flux at large
zenith angles θ consist almost exclusively of muons and the intensity of muons for
energies $>10^{11}$ ev increases with θ. The apparatus uses muon flux to study high ener-
gy muon interactions with matter and measures the characteristics of the horizontal
muon flux to determine the angular and energy distributions. The ionization calori-
meter enables one to study both of these areas by observing the showers produced by
the muons due primarily to bremsstrahlung and nuclear interactions. It detects muons

Card 1/2

L 06347-67

ACC NR: AT6032306

in the energy interval $2\cdot10^{11}$-$5\cdot10^{12}$ ev for $60° \leq \theta \leq 90°$. The instrument consists of 150 ionization chambers arranged in six rows, forming a coordinate set for determining the angle made of a shower. A layer of iron 9 cm thick is placed between each row with a total weight >40 tons. Each chamber is made from a section of waveguide 110 × 54 mm and 3 m long with an electrode 3 mm in diameter at +1200 volts, filled with argon at a pressure of 5 atm. A block diagram of the major component is shown. The pulse from each chamber is amplified and then stored on capacitors in the memory section which is successively probed by a mechanical commutator. The commutator signal is photographed using an H-700 loop oscilloscope. The event selection and switching of the detector take place in the control block. The registration block records the data and a timing relay fixes the detection time of a given event. Orig. art. has: 2 formulas, 7 figures.

SUB CODE: 20/   SUBM DATE: 25Feb66/   ORIG REF: 003/   OTH REF: 008

Card 2/2 mℓℰ

ACC NR: AP7007079

SOURCE CODE: UR/0048/66/030/010/1666/1668

AUTHOR: Borog, V. V.; Kirillov-Ugryumov, V. G.; Petrukhin, A. A.; Shestakov, V. V.

ORG: none

TITLE: Non-electromagnetic interactions of superhigh-energy muons /Paper presented at the All-Union Conference on Cosmic Radiation Physics, Moscow, 15-20 Nov 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 10, 1966, 1666-1668

TOPIC TAGS: muon, cosmic radiation

SUB CODE: 20

ABSTRACT: The non-electromagnetic interactions of superhigh-energy muons ($E \gtrsim 10^{11}$ ev) were recorded at an installation for the study of cascade showers produced by cosmic radiation muons impinging at large zenith angles (cf. Borog et al, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 30, 10, 1669, 1966). The only known process which could give rise to the non-electromagnetic cascade showers recorded was that of nuclear interaction of muons. A comparison of the spectra of nuclear and electromagnetic showers made it possible to evaluate the cross-section $\sigma_{\gamma N}$ of the photonuclear process at $E \gtrsim 10$ ev. By using the relation derived by P. & D. Kessler (Compt. Rend. 244, 1896, 1957), which applies to any transmitted energies, it was established that

$$\sigma_{\gamma N} = 0.15 \, {}^{+0.20}_{-0.10} \cdot 10^{-28} \, \text{cm}^2 \text{ per nucleon.}$$

Card 1/1   Orig. art. has 3 figures and 2 formulas. /JPRS: 39, 658/

ACC NR: AP7007080

SOURCE CODE: UR/0048/66/030/010/1669/1673

AUTHOR: Borog, V. V.; Kirillov-Ugryumov, V. G.; Petrukhin, A. A.; Rozental', I. L.; Shestakov, V. V.

ORG: none

TITLE: Study of the energy spectrum of cosmic-ray muons on the basis of electron-photon showers /Paper presented at the All-Union Conference on Cosmic Radiation Physics, Moscow, 15-20 Nov 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 10, 1966, 1669-1673

TOPIC TAGS: calorimeter, cosmic ray, muon

SUB CODE: 20

ABSTRACT: At present, outer space is the only accelerator of particles with superhigh energies. The energy spectrum of electromagnetic cascades produced by superhigh-energy muons ($E_\mu \gg 10^{11}$ ev) impinging at angles $\geq 55°$ was studied at sea level on an ionization calorimeter consisting of six rows of Ar-filled ionization chambers, 25 in each row, with an iron interlayer between the chambers acting as an absorber. The majority of the cascades recorded were due to the interaction of muons with the absorber. A small number of showers ($< 1\%$) was produced by nucleus-reactive particles. The energy spectrum of the muons was determined on the basis of the recorded showers due to high-energy photons and electrons formed by interaction of the muons with atoms of the absorber. Mathematical equations expressing the experimentally determined energy spectrum The authors think G. G. Bunatyan for help in carrying out the numerical computations on the ETsVM. Orig. art. has: 4 figures and 6 formulas. [JPRS: 39,658]

Card 1/1

ACC NR: AT7008896   SOURCE CODE: UR/0000/66/000/000/0041/0047

AUTHOR: Demidov, V. S.; Kirillov-Ugryumov, V. G.; Ponosov, A. K.; Protasov, V. P.; Sergeyev, F. M.

ORG: none

TITLE: Elastic scattering of Pi-mesons by carbon at energies of 5-22 Mev

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Fizika elementarnykh chastits, 1966, 41-47

TOPIC TAGS: elastic scattering, pi meson, synchrocyclotron, angular distribution
SUB CODE: 20

ABSTRACT: The authors state that in their present undertaking they have succeeded to considerable extent in overcoming the procedural difficulties which have hitherto hindered the study of interactions of slow pi-mesons with complex nuclei. An investigation was made of the elastic scattering of pi-mesons of both signs with energies of 5-22 Mev by carbon C^{12} nuclei. The pi-mesons were recorded in propane bubble chambers exposed to pi-meson beams of the synchrocyclotron of the Joint Institute for Nuclear Research. The purpose of the work was to investigate properties of the potential of the nuclear interaction of a pi-meson with a light nucleus. Selected for the investigation were 8,727 positive and 19,576 negative pi-mesons stopped in the chambers. Certain corrections were made in the experimental data for computing the cross sections. The corrected statistical material was used to

Card 1/2   UDC: 539.1
                                                      0929 [7.1]

ACC NR: AT7008896

obtain the angular distributions of the elastic scattering of pi-mesons. The article lists the experimental values of the differential cross sections for energies of 5-8, 8-15, and 15-22 Mev in the case of positive mesons and 5-8 and 8-15 Mev for negative mesons. A phase-shift analysis was made by the least-squares method on a "Ural" digital computer and a comparison was made of the angular distributions for positive and negative pi-mesons in identical energy ranges. It was established that the potential of the nuclear interaction between a pi-meson and a carbon nucleus at energies 5-22 Mev corresponds to repulsive forces. The phase shifts and potential value which were found agree with data obtained in the investigation of pi-meson atoms and elementary meson-nucleon scattering. The authors express their thanks to A. I. Alikhanyan, L. P. Kotenk), Ye. P. Kuznetsov, and A. V. Samoylov for their help in the work and to Z. S. Galkina, V. A. Yeliseyeva, and Z. A. Volobuyeva for taking part in the measurements. Orig. art. has: 2 formulas and 3 tables. [JPRS]

Card 2/2

ACC NR. AT7008898   SOURCE CODE: UR/0000/66/000/000/0076/0082

AUTHOR: Alikhanyan, A. I.; Aleksanyan, A. S.; Verebryusov, V. S.; Voremeyev, M. M.; Demidov, V. S.; Kirillov-Ugryumov, V. G.; Protasov, V. P.; Ponosov, A. K.; Sergeyev, F. M.

ORG: none

TITLE: Bubble chamber designed to operate in a magnetic field

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Fizika elementarnykh chastits, 1966, 76-82

TOPIC TAGS: austenite steel, bubble chamber, pi meson, synchrotron, photography

SUB CODE: 20, 14

ABSTRACT: The article describes a bubble chamber with an effective volume of 200 liters made of nonmagnetic austenite 1Khl8N9T steel and consisting of a permanent outer vessel and the working chamber proper located inside it. The design of the inner chamber, outer vessel, and expander is generally similar to that described in an earlier article by A. V. Bogomolov et al. The upper lid of the permanent vessel has six windows for photography. Differential three-stage valves are used for increasing pressure and for depressurization in the chamber. The working space of the chamber is illuminated by eight out of sixteen IFK-120 flash bulbs mounted in pairs on a special panel; the lighting system design also permits the use of IFP-4000 bulbs. The photographing is done on two standard aerial photographic films, with a sensitivity of 1200 GOST [Gosudarstvennyy Obshchesoyuznyy

                                                                  UDC: 539.1

Card 1/2

ACC NR: AT7008898

Standart; All-Union State Standard] units and 80 mm width, by two "Gidrorussar-4"-
type objectives. During operation of the chamber chromatic aberration was observed,
resulting in a ghost effect in the particle track image. This was eliminated by
photographing in monochromatic light through an experimentally chosen orange light
filter. The chamber is heated by three 2-kw electric heaters, with one of the
heaters set directly on the inner chamber. There are two versions of thermostat
system control. The first employs a standard contact thermometer mounted in the
chamber casing. The second version employs an electrocontact manometer. The
article includes a block diagram of the chamber's control circuit. The chamber
was tested in operation with various working fluids: propane, a mixture of Freon-12
and Freon-13, a propane-ethane mixture, and propane-Freon and propane-ethane-Freon
mixtures. The chamber is at present set up in an M3-12 magnet in the path of a
beam of negative pi-mesons, 4 Gev in energy, of the proton synchrotron of ITEF
[Institut teoreticheskoy i eksperimental'noy fiziki; Institute of Theoretical and
Experimental Physics]. The actuation cycle of the chamber is 4 seconds. The
authors express their thanks to Ye. V. Kuznetsov, Ya. P. Kuznetsov, M. G. Gornov,
S. M. Gyumin, A. F. FAlin, and E. S. Levonyan for their assistance and "valuable
advice" and to Yu. A. Budagov for "useful discussions". Orig. art. has: 8 figures.
[JPRS]

Card 2/2

KIRILLOVA VASIL'EVA, K.P.   CAND MED SCI

Dessertation: "Role of the Pylorus in the Evacuation of Liquid and Semiliquid
              "ontents of the Stomach."

21 June 49

Central Inst for the Advanced Training of Physicians

SO Vecheryaya Moskva
        Sum 71

KIRILLOVA, A. K

Three-Phase Arc Welding.
(In Russian.) G. P. Mikhailov, A. A.
Kirillova, V. V. Stepanova, and N. M.
Labko. Promyshlennaya Energetika
(Industrial Power), v. 7, Dec. 1960, p.
9-11.

Basic principles of 3-phase arc
welding, automatic 3-phase arc weld-
ing under flux, and technical-eco-
nomic factors. Automatic apparatus.
(K1)

METALLURGICAL LITERATURE CLASSIFICATION

KIRILLOVA, A.A.

    For the youngest. Zdorov'e 2 no.3:28 Mr '56   (MIRA 9:6)

    (FOOD, DRIED) (INFANTS—NUTRITION)

KIRILLOVA, A.A.

    S.S.Perov's apparatus. Nauka i zhizn' 23 no.3:34 Mr '56.
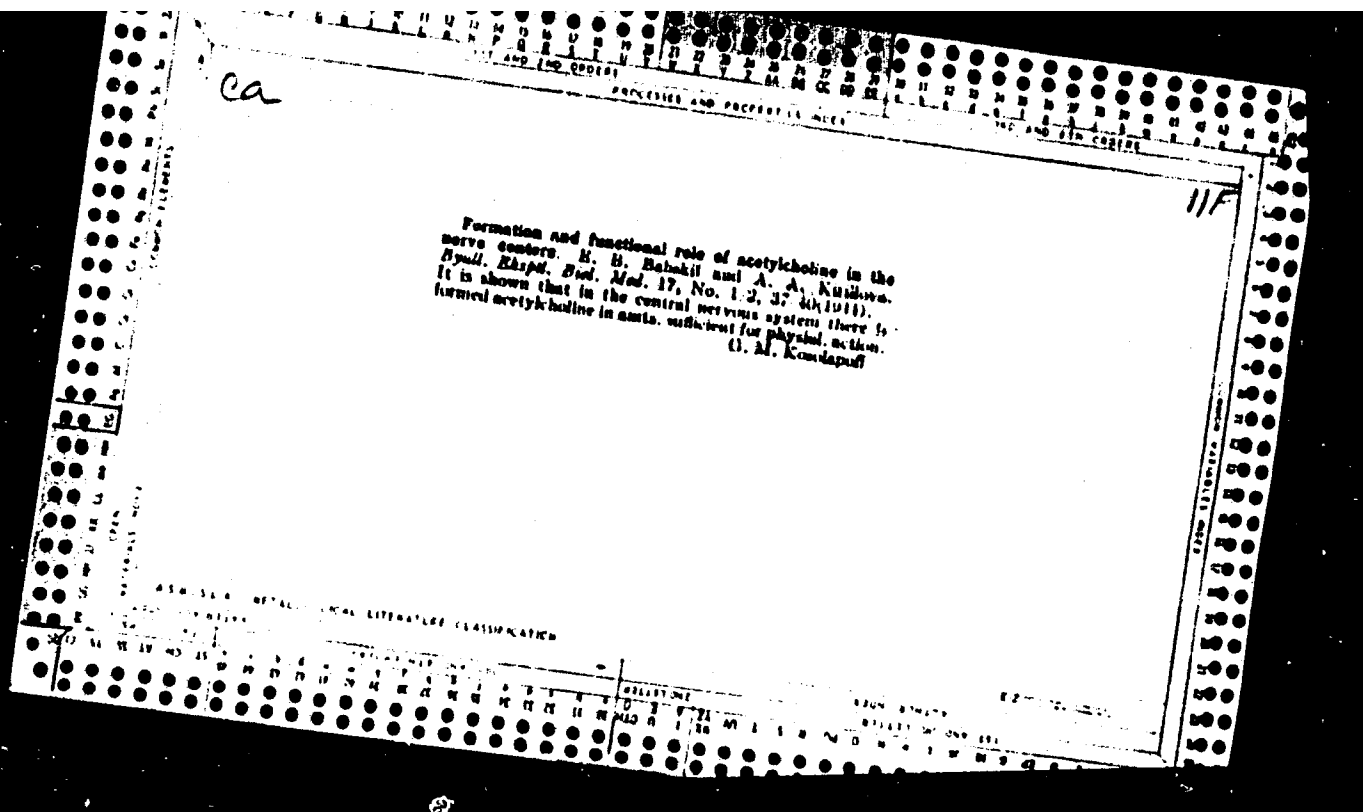   (Milk--Analysis and examination)   (MIRA 9:7)

GAYNIYEV, S.S., dots.; KIRILLOVA, A.A., dots., glav. red.;
     BLAGOVESHCHENSKAYA, N.N., dots., red.; SINYAGINA, N.P.,
     st. prepod., red.
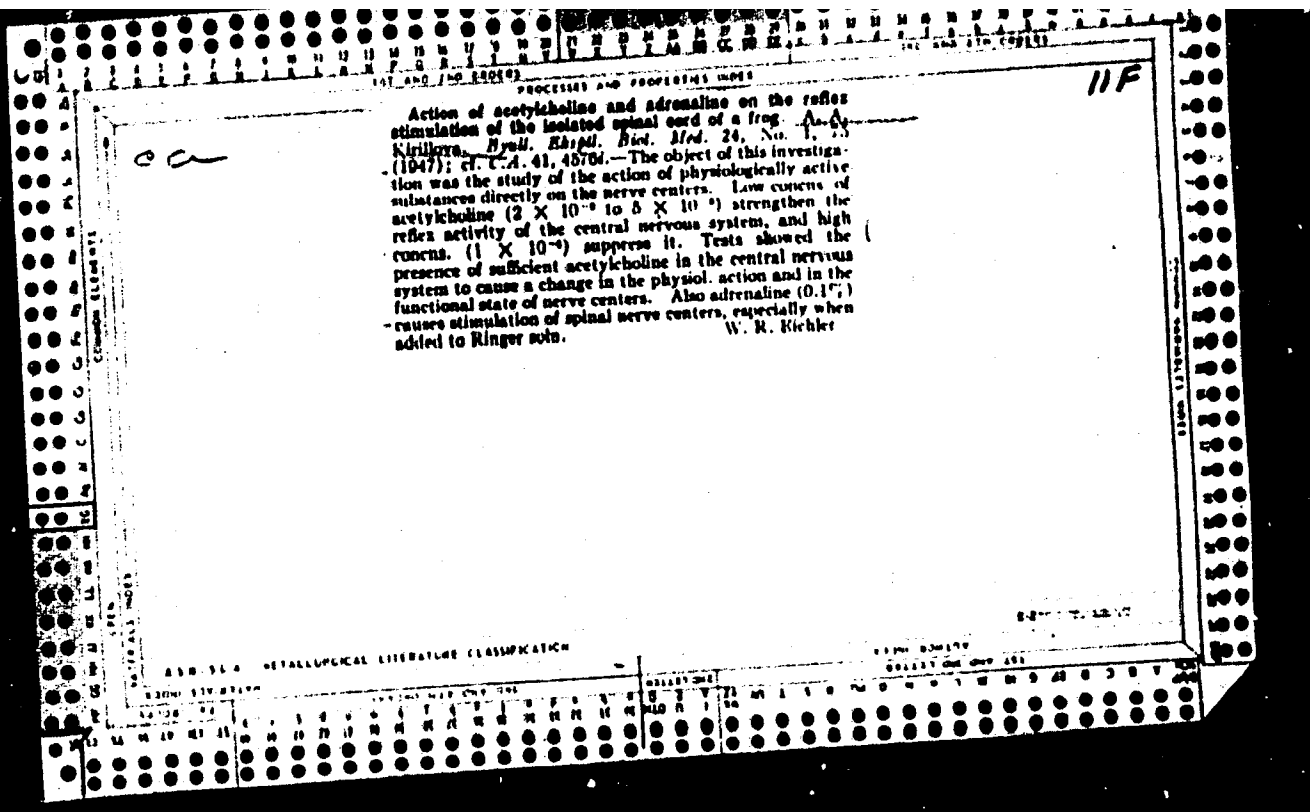
[Vertebrates of Ul'yanovsk Province] Pozvonochnye zhivotnye
Ul'ianovskoi oblasti. Ul'ianovsk, Gos. pedagog. in-t, 1959.
74 p.   (MIRA 16:10)
          (Ul'yanovsk Province--Vertebrates)

11-H

Effect of acetylcholine on the isolated spinal cord of the frog. A. A. Kirillov. *Bull. biol. med. exptl. U.R.S.S.* **16**, No. 7-8, 83-6(1943); *Am. Rev. Soviet Med.* **4**, 209 (1947).—With the spinal cord kept in Ringer soln. contg. 1:800,000 of eserine, concns. of 2×10^{-4}–1×10^{-6} acetylcholine were added to the renewed soln. after the threshold of reflex irritability was established; 10^{-4} reduced the irritability markedly, whereas concns. of 10^{-5} had either a stimulating or an inhibitory effect; lower concns. increased the irritability. In graphic recording of spinal cord reflexes concns. of 10^{-4} resulted either in the disappearance of reflex muscle contractions or in their rapid decline, whereas 5×10^{-5} and 3.3×10^{-5} stimulated the reflexes of the opposite calf muscles. In high concns., acetylcholine depressed the isolated spinal cord of the frog, while low concns. increased reflex reactions. No contraction of muscles connected with nerve centers was observed. This contradicts the role of acetylcholine as an agent transmitting the impulses via the nerve centers; the action of acetylcholine consists in the release or depression of reflex reactions.   W. R. Henn

Formation and functional role of acetylcholine in the nerve centers. K. B. Babskii and A. A. Kulikova. *Byull. Eksptl. Biol. Med.* 17, No. 1, 2, 3, 4 (1944). It is shown that in the central nervous system there is formed acetylcholine in amts. sufficient for physiol. action.
(I. M. Kondapuff)

//F

Action of acetylcholine and adrenaline on the reflex stimulation of the isolated spinal cord of a frog. A. N. Kirillova, *Byull. Eksptl. Biol. Med.* 24, No. 1, 55 (1947); cf. C.A. 41, 4870i.—The object of this investigation was the study of the action of physiologically active substances directly on the nerve centers. Low concns. of acetylcholine (2×10^{-9} to 5×10^{-8}) strengthen the reflex activity of the central nervous system, and high concns. (1×10^{-4}) suppress it. Tests showed the presence of sufficient acetylcholine in the central nervous system to cause a change in the physiol. action and in the functional state of nerve centers. Also adrenaline (0.1%) causes stimulation of spinal nerve centers, especially when added to Ringer soln.   W. R. Kirchler

KIRILLOVA, A. A.

"On the Effect of Acetylcholine and Adrenalin on the Reflex Excitability of the Spinal Cord of the Frog," by A. A. Kirillova, Uch. Zap. Ulyanovskovo Med. In-ta, 1955, Vyp. 6, pp 100-136 (from Referativnyy Zhurnal -- Biologiya, 25 Sep 56, Abstract No 78,780)

"Large concentrations of acetylcholine $(1 \cdot 10^{-6})$ reduced the magnitude of the reflexes of the isolated spinal cord of the frog; small concentrations $(5 \cdot 10^{-8})$ increased it. Large concentrations of acetylcholine raised the threshold of the initial stimulus of the crossed reflex, while small concentrations lowered it. In all experiments the muscular contractions caused by acetylcholine were connected with peripheral excitation. On the excitation of the spinal cord certain highly active substances appeared in the liquid surrounding the cord; these substances also increased the excitability of another spinal cord placed in the same liquid. On the basis of the fact that the addition of eserine was necessary to maintain the activity of these substances, as well as on the basis of tests conducted on the heart and muscles of a leech, it was concluded that the substance liberated from the spinal cord was acetylcholine, and that acetylcholine, although not a mediator, was the substance which modified the excitability and functional condition of the central nervous system.

"Adrenalin in small concentrations (1:5,000,000) caused a steady rise in the excitability of the spinal cord; in large concentrations (1:1,000,000) it lowered it. This diminution of excitability, however, was eliminated by the placing of the spinal cord in Ringer's solution with glucose. It was concluded that adrenalin may act directly on the nerve elements by modifying metabolism in the nerve centers (metabolism of carbohydrates primarily)."

Sum 1239

KIRILLOVA, A.A.

Adhesives for labeling machines. Kons.i ov.prom. 17 no.2:17-19
F '62.
(MIRA 15:5)

1. Ukrainskiy nauchno-issledovatel'skiy institut konservnoy
promyshlennosti.
(Labeling machines)
(Adhesives)

KIRILLOVA, A.A.; BARGMAN, S.Ye.; INDICHENKO, L.D.

Polyacrylamide glue for gluing lables on glass containers. Kons.i
ov.prom. 17 no.10:41 O '62.   (MIRA 15:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut konservnoy
promyshlennosti (for Kirillova). 2. Odesskiy konservnyy zavod
imeni V.I.Lenina (for Bargman, Indichenko).
                              (Adhesives)

MEL'NICHENKO, Ye.L. [Mel'nychenko, IE.L.]; KIRILLOVA, A.A.
      [Kyrylova, O.O.]

      Causes of the excess breakage of glass containers. Khar.
      prom. no.1:80-82 Ja-Mr '65.   (MIRA 18:4)

KRASNAYA, B.Ya. [Krasna, B,IA.]; KIRILLOVA, A.A. [Kyrylova, ?.?.];
ZYABKO, L.P.; SAVCHUK, N.I.

New synthetic glue for labeling machines. Khar. prom. no.3:26-27 Jl-S '65.
(MIRA 18:9)

KIRILLOVA, A. D.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

Physicochemical analysis of the interaction between pyridine and nitrophenols. O. E. Dionis'ev and A. D. Kirillova. J. Gen. Chem. U.S.S.R. 22, 2143-7(1952)(Engl. translation).—See C.A. 47. 4730d.   H. L. H.

KIRILLOVA, A.D.; DIONIS'YEV, D.Ye.

Investigation of the reaction of quinoline with nitrophenols, by means of methods of physicochemical analysis. Zhur.ob.khim. 23 no.7:1103-1107 Jl '53.

(MLRA 6:7)

1. Kafedra organicheskoy khimii Rostovskogo Gosudarstvennogo universiteta.
(Systems (Chemistry)) (Quinoline) (Nitrophenols)

KIRILLOVA, A.D.; DIONIS'YEV, D.Ye.

Investigation of the reaction of quinoline with α- and β-naphthols. Zhur. ob.khim. 23 no.7:1107-1111 Jl '53. (MLRA 6:7)

1. Kafedra organicheskoy khimii Rostovskogo na Donu Gosudarstvennogo universiteta imeni V.M.Molotova.
(Systems (Chemistry)) (Quinoline) (Naphthols)

KIRILLCVA, A. G.

"Investigation of the Effect of Separate Methods of Product Processing on the Mechanincal Properties of High-Voltage Porcelain." Sub 17 Sep 51, Moscow Order of the Lenin Chemicotechnological Inst imeni D. I. Mendeleyev

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

KIRILLOVA, A.G., inzh.; KARASEV, K.I., kand. khim. nauk

Recommendations for an economical method of preparing and finishing cabinetwork by using thixotropic enamel paints at woodworking enterprises. Sbor. inform. soob. VNIIDM no.15:70-76 '62.   (MIRA 18:3)

KIRILLOVA, Aleksandra Grigor'yevna; BOKIT'KO, M.V., nauchnyy red.;
VLADIMIROVICH, A.G., red.; TOKER, A.M., tekhn.red.

[Modern painting methods] Sovremennye metody maliarnykh rabot.
Moskva, Vses.uchebno-pedagog.izd-vo Trudrezervizdat, 1959.
81 p.   (MIRA 13:4)
            (Painting, Industrial)

KIRILLOVA, A., inzh.,

Using new synthetic paints. Na stroi. Mosk. 2 no.4:15-17 Ap '59.

(MIRA 12:7)

(Paint)

KIRILLOVA, A., inzh.

Centralized production of paints in the Trust for Special Finishing Work in Leningrad. Na stroi. Mosk. 2 no.7:29-31 Jl '59. (MIRA 12:10)

(Leningrad--Paint industry)

KIRILLOVA, A.G.; GYUNTER, A.R., red. izd-va; KOMAROVSKAYA, L.A., tekhn. red.

[Technical and economic indices of finishing work in housing and public construction]Tekhniko-ekonomicheskie pokazateli otdelochnykh rabot v zhilishchno-grazhdanskom stroitel'stve. Moskva, Gosstroiizdat, 1962. 118 p. (MIRA 15:11)
          (Building—Details)

KIRILLOVA, A.G., inzh.

Economic prerequisiter for using new paint in furniture cabinetwork. Sbor. inform. soob. VNIIMEH no. 5:22-24 '62.   (MIRA 18.3)

KUSHTALOV, G.N.; KIRILLOVA, A.I.

Some investigations of the changes in moisture and fat content of
fish occuring in its frying in oil. Izv.vys.ucheb.zav.; pishch.
tekh. no.3:96-100 '63.
(MIRA 16:8)

1. Astrakhanskiy tekhnicheskiy institut rybnoy promyshlennosti
i khozyaystva, kafedra tekhnologii rybnykh produktov.
(Fish, Canned)

PA 4/49719

KIRILLOVA, A. S.

USSR/Chemistry - Polarography, In Indus-   Apr 48
                  trial Laboratories
    Chemistry - Nickel, Determination of

"Determination of Nickel and Copper in Hydrogenated
Fat by the Polarographic Method," I. A. Korshunov,
A. S. Kirillova, Chem Inst, Gor'kiy State U, 1 p

"Zavod Lab" Vol XIV, No 4

Present OST method for checking fat for traces of
metallic catalysts is gravimetric and takes 25-30
hours. Polarographic method described takes 50
minutes.

4/49719

Polarographic investigation of nitrobenzene. I. A. Korshunov and A. S. Kirillova. Zhur. Obshchei Khim. (J. Gen. Chem.) 18, 785 (9?)(1918).—PhNO₃ at concns. 5×10^{-4}–3×10^{-4} M, at 25°, in O₂-free solns., gives at pH > 4, one normal polarographic wave. In acid soln., at pH < 4, a 2nd wave appears, at potentials increasingly negative with decreasing pH; this 2nd wave becomes quantitatively measurable at a sufficiently low pH, rising pH, particularly at high c, that of the 2nd wave is practically independent of the pH and is approx. ⅙ of that of the 1st wave. In the 1st wave, the variation of i with c depends on the range of c, the proportionality coeff. decreasing with increasing c. At const. c, the half-wave potential $E_{½}$ of the 1st stage of the reduction (2nd wave) becomes relatively negative with rising pH; at const. pH, it varies relatively little with c; thus, at pH 1.17, a 60-fold increase of c shifts $E_{½}$ to a more neg. value by 90 mv.; in the 2nd wave, the displacement of $E_{½}$ to more neg. values with increasing pH and c is more rapid. Within each stage, the relation $E - E_{½} = (0.058/n) \log [i/(i_d - i)]$, where i_d = limiting diffusion current, remains valid, giving for the no. of electrons involved in reversible reduction, $n = 1$. The data are interpreted by a sequence of reactions (R = PhNO₃): R + 2e ⇌ R⁻⁻; R⁻⁻ + H⁺ ⇌ RH⁻; RH⁻ + H⁺ ⇌ RH₂, followed by the irreversible step RH₂ → PhNO + H₂O. This gives for the half-wave potential the expression $E_{½} = E_0 + (RT/2F) \ln (K_1 K_2 + K_2[H^+] + [H^+]^2/[RH_2])$, where K_1 and K_2 are, resp., the equil. consts. $[R^{--}][H^+]/[RH^-]$ and $[RH^-][H^+]/[RH_2]$, which at low pH simplifies to $E_{½} = E_0 + 0.058 \log [H^+]$, at very high pH, high pH to $E_{½} = E_0$; at $[H^+]^2 < K_1 K_2$, hence $E_{½} = $ const., independent of pH. This is in agreement with exptl. data, $E_{½}$ being const. in alk. soln., and varying according to $E_{½} = $ const. $- 0.058$ (pH) in acid soln. Reduction on a dropping-Hg cathode thus appears to proceed over the stages PhNO₃ + 2H⁺ + 2e → PhNO₂H₂ → PhNO + H₂O.

PhNO₂ + 2H⁺ + 2e → PhNOH₂; PhNOH₂ + 2H⁺ + 2e → PhNH₂ + H₂O, involving both reversible and irreversible steps, which accounts for the impossibility of oxidation of PhNH₂ to PhNO₂ on a Hg cathode. Polarographic maxima which appear at c of the order of 10⁻⁴ are efficiently suppressed by addns. of gelatin which also shifts $E_{½}$ to more neg. values. This is attributed mainly to an inhibition of the adsorption of PhNO₃ on the Hg.

N. Thon

KIRILLOVA, A. S.

Polarographic determination of aromatic ketones and aldehydes. I. A. Korshunov, Z. B. Kuznetsova, L. N. Shishova, and A. S. Kirillova (Gorki State Univ.). Zavodskaya Lab. 16, 141-6(1950).—For AcPh, Ph₂CO, p-Me₂NC₆H₄CHO, and B₂H only one diffusion wave is seen in acid solns. but raising the pH from 3 to 6 brings up a 2nd wave, which is the only one left when the pH rises above 6. Cinnamaldehyde gives also a 3rd wave which is present at all pH values and changes from −1.49 v. half-wave potential at pH 2.93 to −1.22 v. at pH 9.55. The half-wave potential (against satd. calomel electrode) is as follows: for AcPh −1.07 and −1.6 v.; Ph₂CO −1.1 and 1.45; B₂H −1.0 and −1.35; p-Me₂NC₆H₄CHO −0.95 and −1.65; PhCH:CHCHO −0.90 and −1.84 v., resp. Polarographic detns. of these substances are readily performed when alc. solns. of the materials are used, since their soly. in H₂O is poor; 0.1-1.0 N HCl may be satisfactorily used as the solvent in such cases.
G. M. Kosolapoff

C A

Reduction of acetophenone, benzophenone, and benzoylacetone at a dropping-mercury cathode. I. A. Korshunov, A. S. Kirillova, and Z. B. Kuznetsova (Univ., Gorkii). *Zhur. Fiz. Khim.* 24, 661-8 (1950); cf. *C.A.* 43, 8310f.—The half-wave potentials v (referred to satd. HgCl electrode) and the diffusion currents i were detd. in 5% EtOH for PhCOMe, 30% EtOH for PhCO, and 30% EtOH for BzCH$_2$Ac in HCl + KCl, acetate, and phosphate buffers. PhCOMe had one wave ($v = -1.35$ v. at pH 4 5.5) at pH less than 1.5 and $v = -1.35$ v. at pH 4 5.5) at pH less than 4.8, two waves between pH 4.8 and 5.6, and only the second wave ($v = -1.6$ to -1.8 v.) at greater pH. At pH less than 4.8 and more than 5.6, i was proportional to the concn. of PhCOMe (3-10 millimol./l.). PhCO had 2 waves (-1.0 to -1.14 v. and -1.4 to -1.5 v.) at pH 6.5 and only the 2nd wave at pH more than 6.5. The value of i was proportional to the concn. but depended on the buffer. BzCH$_2$Ac had one wave (in the buffer solns.) whose v was -1.00, -1.38, and -1.66 at pH 0.5, 2.3, and more than 4, resp., i was independent of pH at pH less than 5, and decreased linearly to zero when pH increased to 12. In solns. of LiCl, LiOH, and MeNI, BzCH$_2$Ac had 2 waves. In alk. solns. its i increased with time and was, e.g., at pH 12 as great after 30 days as i of a fresh soln. at pH 7.5. This aging was due to formation of diketo form which in acid solns. forms too rapidly for measurement. In 0.5 N LiOH the const. of this animol. reaction was 5×10^{-3} cm. at src. J. J. Itikerman

KIRILLOVA, A. S.

183T31

USSR/Chemistry - Polarography   Jul/Aug 51

"Brief Communication: Polarographic Determination of Acrolein in Glycerin," A. S. Kirillova, I. A. Korshunov, Gor'kiy State U

"Zhur Analit Khim" Vol VI, No 4, pp 257, 258

Worked out simplified polarographic method for quant detn of acrolein in tech glycerin which is more accurate than method described in OST 539 NK PP. Method uses mixt of glycerin to be analyzed and HCl. Time for detn: 5-10 min.

183T31

LC

cA   4

Polarographic study of sulfamide compounds I. A Korshunov, A. S. Kirillova, M. K. Shchennikova, and L. N. Sazanova. *Zhur. Obshchei Khim.* (J. Gen. Chem.: 21, 563-70(1951).—It was shown that Albucid (p-H₂NC₆H₄SO₂NHAc), sulfathiazole, sulfazole (sulfamethylthiazole), sulfadiazine, and sulfapyridine can be reduced at the dropping-Hg electrode and to yield a diffusion current in solns. contg. 0.1 N Me₄NI. Compds. that can be reduced are those with reducible atomic groups or those having properties of weak acids. Sulfanilamide could not be reduced up to −2.3 v. and neither were the Basic Streptocide (p-H₂NSO₂C₆H₄N:NC₆H₄(NH₂)-o.p) and Soluble Streptocide (3,6-disulfo-7-acetamidonaphthyl analog of the above). Albucide gives the half-wave potential of −2.16 to −2.2 v.; sulfapyridine about −1.8 v., sulfadiazine about −1.8 v., sulfathiazole from 1.66 to 1.74 v., sulfazole from 1.73 to 1.66 v. (proportionality of diffusion current concn. holds only between 1.5 and 4.5 × 10⁻⁴ mole/l.), disulfan from 1.7 to 1.86 v. The diffusion coeff. was low for all compds. (10⁻⁷ − 10⁻⁹), the largest, 0.28 × 10⁻⁶ sq. cm./sec., being found for Albucide.   G. M. Kosolapoff

Gorkii State U., Sci. Res. Inst. Chem.

1951

RABINOVICH, I.B.; TEL'NOY, V.I.; NIKOLAYEV, P.N.; RAZUVAYEV, G.A.; Prinimala
uchastiye: KIRILLOVA, A.S.

Thermochemistry of the interaction between hexaethyldistannane and
benzoyl peroxide. Dokl.AN SSSR 138 no.4:852-855 Je '61.

(MIRA 14:5)

1. Institut khimii pri Gor'kovskom gosudarstvennom universitete imeni
N.I.Lobachevskogo. 2. Chlen-korrespondent AN SSSR (for Razuvayev).
(Tin compounds)   (Benzoyl peroxide)

RABINOVICH, I.B.; TEL'NOY, V.I.; KIRILLOVA, A.S.; RAZUVAYEV, G.A.

Heats of decomposition and formation of dicyclohexyl- and
dimethylperoxydicarbonate. Dokl. AN SSSR 143 no.1:133-
136 Mr '62.   (MIRA 15:2)

1. Nauchno-issledovatel'skiy institut khimii pri Gor'kovskom
gosudarstvennom universitete im. N.I.Lobachevskogo 2. Chlen-
korrespondent AN SSSR (for Razuvayev).
                        (Peroxydicarbonic acid)

KIRILLOVA, A.V.

KIRILLOVA, A.V. (Sverdlovsk)

State of mineral metabolism in hypertension. Klin.med. 35[i.e.34] no.1 Supplement:3-4 Ja '57.   (MIRA 11:2)

1. Iz Sverdlovskogo nauchno-issledovatel'skogo instituta fizicheskikh metodov lecheniya Ministerstva zdravookhraneniya RSFSR.
        (HYPERTENSION)   (MINERALS IN THE BODY)

KIRILLOVA, A.V.

Method for determining the cholesterol content of the blood. Lab. delo 5 no.3:36-39 My-Je '59.   (MIRA 12:6)

1. Iz biokhimicheskoy laboratorii Sverdlovskogo nauchno-issledovatel'-skogo instituta kurortologii i fizioterapii.
        (CHOLESTEROL) (BLOOD--ANALYSIS AND CHEMISTRY)

KIRILLOVA, A.V.

First Sverdlovsk Province Conference of Laboratory Personnel.
Lab. delo 10 no.5:318-320 '64.   (MIRA 17:5)

Country	:	USSR
Category=	:	Human and Animal Physiology. Lactation.
Abs. Jour.	:	Ref Zhur-Biol., No 23, 1956, 106717
Author	:	Kirillova, B. R.
Institut.	:	Dniepropetrovsk Medical Institute.
Title	:	The Dynamics of Milk Protein Composition in Various Groups of Women Based on Long Observation Methods.
Orig. Pub.	:	Sb. nauchn. rabot. Dniepropetr. med. in-t, 1956, 1, 223-224
Abstract	:	Fifty-one women were investigated (21 of them with hypogalactia). 1.75 percent of protein (P) were revealed in the colostrum. At the end of the 2nd week, the content of P in milk amounted to 1.57 percent, at the close of the 3rd-4th week, it amounted to 1.47 percent, by the 2nd-3rd month of lactation to 1.44 percent, and by the 11th-12th month to 1-1.5 percent. In hypogalactia, P content is approximately the same at the beginning of lactation as in normal
Card:		1/2
Card:		2/2 80

KIRILLOVA, E. I.

6275. Kirillova, E. I.   Izucheniye termicheskogo raspada polivinilkhlorida
L., 1954. 14s. 20sm. (M-vo vyssh. obrazovaniya SSSR. Leningr. ordena Trud.
Krasnogo Znameni tekhnol. In-t im. Lensoveta. kafedra plast. mass). 100ekz.
B. Ts. /54-58197/

SO: Knizhamya Letopis' 1, 1955

KIRILLOVA, E.I.; MATVEYEVA, Ye.N.; POTAPENKO, T.G.; RACHINSKIY, F.Ya.
SLOVACHEVSKAYA, N.M.

Effect of certain organic compounds on the thermal decomposition of
polyvinyl butyrals. Plast.massy no.5:15-19 '61.   (MIRA 14:4)
                        (Vinyl compounds)

KIRILLOVA, E.I.; MATVEYEVA, Ye.N.; ZAVITAYEVA, L.D.; FRATKINA, G.P.;
OBOL'YANINOVA, N.A.

Aging of polysterene plastics; thermal aging of styrene copolymers
with acrylonitrile. Plast.massy no.8:3-10 '62.   (MIRA 15:7)
(Styrene polymers) (Plastics)

S/191/62/000/011/001/019
B101/B186

AUTHORS: Kirillova, E. I., Matveyeva, Ye. N., Leytman, K. A.,
Fratkina, G. P.

TITLE: Aging of polystyrene materials. Photoaging of styrene -
acrylonitrile copolymer, and its stabilization against
ultraviolet radiation

PERIODICAL: Plasticheskiye massy, no. 11, 1962, 3-6

TEXT: Films of polystyrene (PS) and of its copolymers CH-10 (SN-10) and
CH-28 (SN-28) containing 10 and 28% polyacrylonitrile, respectively,
were irradiated with ultraviolet light from a mercury lamp
(λ = 2483-5770 Å; Q = 0.0152 cal/cm^2·min) at 25-30°C. The film thickness
was 50-100 μ, the molecular weight 118,000-194,000, the time of irradia-
tion about 400 hrs. The amount of the resulting insoluble fraction and
the intrinsic viscosity [η] of the soluble fraction were determined.
Results: (1) The amount of insoluble fraction rose with increasing
acrylonitrile content, and even more so after reprecipitation.
(2) Molecular weight and [η] dropped rapidly within the first 50 hrs, and
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Aging of polystyrene materials. ...   S/191/62/000/011/001/019
                                                       B101/B186

approached a constant value after 200 hrs. The content of acrylonitrile did not affect the course of these curves. Samples of high molecular weight were destroyed faster than samples of low molecular weight. (3) After 400 hrs irradiation, the content of peroxide compounds was 0.06% in PS and 0.08% in SN-28. (4) The spectra of the irradiated PS films showed a formation of carbonyl groups (1700 cm⁻¹ band); further, a weak band appeared at ·'3400 cm⁻¹ (OH groups), and a broad one at 1100-1300 cm⁻¹. In SN-28, a 1720 cm⁻¹ band was observed which may due to aldehydes, ketones, or aromatic ethers. (5) Formation of volatile products was not observed after 60 hrs irradiation at 60-70°C. Here, the oxygen content in PS increased from 0.2 to 2%. Addition of 0.5 mole% of benzoyl peroxide increased the degree of destruction to the 6-8fold without any change in the spectra. An attempt was then made to stabilize SN-28 by adding substances having an absorption maximum at 300-400 mμ. Results: (a) 0.5 mole% admixtures of β-naphthyl salicylate, disalicylidene ethylene diamine, its copper salt, 4-propene oxide-2,4-dihydroxy benzophenone, 2,4-dibenzoyl resorcinol, a reaction product of anisole acetone with o-cresol, proved to be weak inhibitors. The effect of 0.5 mole% of 2-hydroxy-4-methoxy benzophenone, as well as that of the

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propoxy and butoxy homologs, was to make $[\eta]$ decrease not by 62.3% but only by 20-24%. The protective effect increased with increasing concentration of these compounds. The compounds mentioned, doubled the resistance to UV-aging of SN-10 and SN-28, also under atmospheric effects, both in regions of a dry and hot climate with total solar radiation, $Q = 48$ cal/cm^2·min, at 12.7-25.8°C, and in regions of a moderate, moist climate with $Q = 37.2$ cal/cm^2·min, at 4.1-16.9°C. There are 7 figures and 2 tables.

Card 3/3

ACCESSION NR: AP4018158   S/0191/64/000/003/0010/0013

AUTHORS: Kirillova, E.I.; Matveyeva, Ye.N.; Leytman, K.A.; Fratkina, G.P.

TITLE: Relative light stability of polystyrene polymers

SOURCE: Plasticheskiye massy#, no.3, 1964, 10-13

TOPIC TAGS: polystyrene, light stability, styrene acenaphthylene co-polymer, styrene methylstyrene copolymer, styrene vinylnaphthalene co-polymer, polymonochlorostyrene, polydichlorostyrene, oxidation inten-sity, copolymer film oxidation, photodecomposition, photopolymeriza-tion

ABSTRACT: The photodecomposition of styrene copolymers with acenaph-thylene, alpha-methylstyrene, beta-vinylnaphthalene, polymonochloro-styrene and polydichlorostyrene was investigated. The stability of the following polymers against destruction at 270 occured in the foll-owing decreasing order: styrene-beta-vinylnaphthalene copolymer, sty-rene-alpha-methylstyrene copolymer, polystyrene, styrene-acenaphthy-lene copolymer, polydichlorostyrene, and polymonochlorostyrene, the last stable. Polydichlorostyrene, the styrene-acenaphthylene and the styrene-alphamethylstyrene copolymers do not polymerize further on

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ACCESSION NR: AP4018158

photo-aging. Polymerization does play a basic role in the photo-aging of styrene-beta-vinylnaphthalene copolymer and of polymonochlorostyrene. The intensity of oxidation of these polymers, as determined by the formation of the carbinol absorption band at 1720 cm^{-1} in the IR spectra, increases rapidly in the first 25 hours with temperature increase from 27 to 620; thereafter the oxidation increases less noticeably, but after 200 hours it is still somewhat higher at the higher temperature. The intensity of the following polymers to oxidation at 62C decreases in the following order: styrene-acenaphthylene copolymer, styrene-beta-vinylnaphthalene copolymer, polymonochlorostyrene, styrene-alpha-methylstyrene copolymer and polydichlorostyrene, the most stable. Styrene copolymer films are oxidized on the surface only to a thickness of about 20 microns. Orig. art. has: 8 figures, 1 table and 2 formulas

ASSOCIATION: None

SUBMITTED: 00   DATE ACQ: 27Mar64   ENCL: 00

SUB CODE: PH, MA   NR REF SOV: 002   OTHER: 004

Card 2/2

KIRILLOVÁ, E. I.; MATVEYEVA, Ye. N.; LEYTMAN, K. A.; FRATKINA, G. P.

Aging of polystyrene materials. Light aging of the copolymer of styrene with acrylonitrile and its stabilization against the effect of ultraviolet rays. Plast. massy no.11:3-6 '62.
(MIRA 16:1)

(Styrene polymers)   (Acrylonitrile)
(Ultraviolet rays)

L 2272-66   EWT(m)/EPF(c)/EWP(j)/T/EWP(m)   WW/RM

ACCESSION NR: AP5022228   UR/0191/65/000/009/0055/0059

                                           678.746.019.391.01:543.42

AUTHOR: Fratkina, G. P.; Kirillova, E. I.; Glagoleva, Yu. A.; Leytman, K. A.

TITLE: Study of the thermal and light aging of certain polystyrene plastics by means of infrared spectroscopy

SOURCE: Plasticheskiye massy, no. 9, 1965, 55-59

TOPIC TAGS: polystyrene, light aging, thermal aging

ABSTRACT: The aging of polyvinyltoluene and impact-resistant block polystyrene was studied on films 50-100 μ thick. Infrared spectra of the decomposition products were used for their identification. A comparison of the thermal and light aging of the two compounds studied, which differ in the presence of one CH₃ group at the para position in the benzene ring of polyvinyltoluene, points up a marked difference in their behavior: (1) during the aging of polystyrene, the main process taking place is the destruction of the chains, whereas during the aging of polyvinyltoluene, the process is cross-linking, and (2) the main oxidation products of polystyrene are aromatic ketones, whereas the oxidation of polyvinyltoluene produces chiefly aromatic aldehydes. Chemical mechanisms

Card   1/2

L 2272-66

ACCESSION NR: AP5022228

are proposed to explain both types of these types of behavior. Orig. art. has:
9 figures.

ASSOCIATION: none

SUBMITTED: 00   ENCL: 00   SUB CODE: MT, OP

NO REF SOV: 005   OTHER: 004

Card 2/2

FRATKINA, G.P.; KIRILLOVA, E.I.; GLAGOLEVA, Yu.A.; LEYTMAN, K.A.

Infrared spectroscopy method for the study of thermal- and photoaging
of certain polystyrene plastics. Plast. massy. no.9:55-59 '65.
(MIRA 18:9)

KIRILLOVA, E.I.; MATVEYEVA, Ye.N.; ZAVITAYEVA, L.D.; GLAGOLEVA, Yu.A.;
LEYTMEN, K.A.; FRATKINA, G.P.

Studying the physicomechanical properties of shock-resistant
polystyrenes during aging. Plast. massy no.2:43-45 '66.
(MIRA 19:2)

L 20799-66   EWA(h)/EWP(j)/EWT(m)/T/EWA(1)   IJP(c)   RM

ACC NR: AP6005953   (A)   SOURCE CODE: UR/0191/66/000/002/0043/0045

AUTHORS: Kirillova, E. I.; Matveyeva, Ye. N.; Zavitayeva, L. D.; Glagoleva, Yu. A.; Leytman, L. A.; Frenkina, G. P.

ORG: none

TITLE: A study of the physicomechanical properties of impact-resistant polystyrenes during aging

SOURCE: Plasticheskiye massy, no. 2, 1966, 43-45

TOPIC TAGS: polystyrene, light aging, thermal aging, impact strength, elongation, hydroxyl group, polymer/ UP-1 polystyrene, UPP-2 polystyrene, PS-SU polystyrene, SNP-2 polystyrene

ABSTRACT: The changes in the physicomechanical properties of impact-resistant polystyrenes UP-1, UPP-2, PS-SU$_2$, PS-SU$_3$, and SNP-2 during thermal, light, and atmospheric aging are studied. Accelerated light aging was done under a PRK-4 lamp. Thermal aging was done in a thermostat at 60C with sampling every 500, 1000, 2000, and 3000 hrs. Light aging greatly changed the specific impact strength and somewhat changed the specific elongation (see Fig. 1).
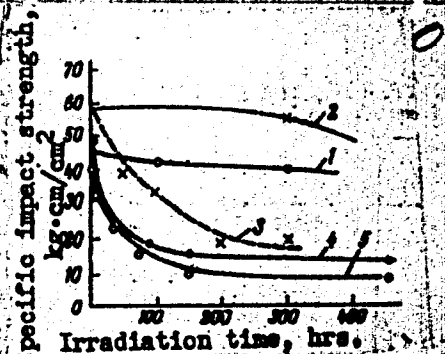
Card 1/3   UDC: 678.746.22—13:678.029.72:0.11539.3

L 20799-66

ACC NR: AP6005953

Fig. 1. Change in specific impact strength with
irradiation: 1 and 2 - SNP; 3 - SNP
(irradiation at 50-600); 4 - UPP-2 with
TiO$_2$ filler; 5 - UPP-2 without filler.

The SNP-2 was practically unchanged by thermal aging, while the other poly-
styrenes were affected more (see Fig. 2).

Fig. 2. Change in specific impact strength with
prolonged heat aging at 600; 1 - UPP-2
without filler; 2 - UP-1; 3 - SNP;
4 - PS-SU$_3$; 5 - PS-SU$_2$.

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L 20799-66

ACC NR: AP6005953

Ultraviolet rays and increased temperatures affect polystyrenes by reducing the specific impact strength and specific elongation and lead to the formation of carbonyl and hydroxyl groups with a simultaneous decrease in the number of double bonds. The study of aging of impact-resistant polystyrenes is being continued. Orig. art. has: 10 graphs.

SUB CODE: 11 / SUBM DATE: none/ ORIG REF: 001/ OTH REF: 006

Card 3/3

BIBLINA, B.I.; KIRILLOVA, E.N.; SAVCHENKO, L.F.

Some characteristics of metabolism in young and old grapevines.
Vop.fiziol.i biokhim.kul't.rast. no.1:90-96 '62.   (MIRA 16:1)
            (Grapes)   (Plants—Metabolism)

1. KIRILLOVA, F. G.

2. USSR (600)

4. Sadkinskiy Region - Borings

7. Geological report of the Bugurusian "kreliusnyi" petroleum exploration on the basis of the borings in the Sadkinskiy area for 1942-1943. (Abstract.) Izv.Glav.upr.geol.fon. no. 2, 1947.

9. Monthly Lists of Russian Accessions, Library of Congress, March 1953, Unclassified.

KIRILLOVA, F.M.

RITOVA, V.V.; STEFANSKAYA, A.F.; BOGOMOLOVA, N.N.; KIRILLOVA, F.M.

Specific prophylaxis of influenza in infants. Vop.virus. 1 no.4:
30-33 Jl-Ag '56.   (MIRA 10:1)

1. Institut virusologii imeni D.I.Ivanovskogo AMN SSSR, Moskva.
       (INFLUENZA, prevention and control,
           vacc. in Russia (Rus))
       (VACCINES AND VACCINATION,
           influenza vacc. in Russia (Rus))

AVAKYAN, A.A.; AL'TSHTEYN, A.D.; KIRILLOVA, F.M.; BYKOVSKIY, A.F.

Means for the improvement of laboratory smallpox diagnosis. Vop.
virus. 6 no.2:196-203 Mr-Ap '61.   (MIRA 14:6)

1. Laboratoriya morfologii virusov i elektronnoy mikroskopii
Instituta po izucheniyu poliomyelita AMN SSSR, Moskva.
                        (SMALLPOX)

KIRILLOVA, F.M.

 Study of poliomyelitis virus in tissue culture by means of fluroes-
cent antibodies. Vop. virus 6 no.4:395-399 Jl-Ag '61.
               (MIRA 14:11)

 1. Institut poliomyelita i virusnykh entsefalitov AMN SSSR, Moskva.
   (POLIOMYELITIS)   (ANTIGENS AND ANTIBODIES)

LOTTE, V.D.; KIRILLOVA, F.M.

Use of the fluorescent antibody method for studying the localizaticn
of influenza and parainfluenza virus antigens during the process of
their multiplication in the cells. Vop. virus. 6 no.6:656-664 N-D
'61.
                                                        (MIRA 15:2)

1. Institut poliomiyelita i virusnykh antsefalitov AMN SSR, Moskva.
          (INFLUENZA_MICROBIOLOGY)   (ANTIGENS AND ANTIBODIES)

ACC NR: AP6033936   SOURCE CODE: UR/0280/66/000/004/0003/0013

AUTHOR: Gabasov, R. (Sverdlovsk); Kirillova, F. M. (Sverdlovsk)

ORG: none

TITLE: Certain applications of functional analysis to the theory of optimal processes

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 4, 1966, 3-13

TOPIC TAGS: optimal control, mathematic analysis, variational problem, computer design,
computer simulation

ABSTRACT: A functional analysis approach to problems in optimal control is discussed.
The synthesis of optimal control is divided into three phases: 1) the reduction of
the variational problem to operations with functions of a finite number of variables;
2) the investigation of the qualitative aspects of optimal processes, such as the ques-
tion of realizability, uniqueness, continuous dependence of the solution upon the ini-
tial data and parameters, and the possibilities of boundary transitions from the solu-
tions with one type of limitations to solutions with limitations of another type; and
3) the synthesis of computational operations and their experimental examination with
respect to the speed of convergence and stability. The authors describe these synthe-
sis phases in great detail, including experimentally proven computer algorithms, and
investigate two concrete problems. Orig. art. has: 20 formulas.

SUB CODE: 12/   SUBM DATE: 15Nov65/   ORIG REF: 026/   OTH REF: 006

Card 1/1

AUTHOR: Kirillova, F.M.   SOV/140-58-4-13/30

TITLE: On the Correctness of a Problem of Optimal Control (O korrektnosti postanovki odnoy zadachi optimal'nogo regulirovaniya)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy.Matematika, 1958, Nr 4, pp 113-125 (USSR)

ABSTRACT: In the well-known paper [Ref 1] Pontryagin and other authors gave a rigorous mathematical formulation of the problem of optimal control. Here and in some further papers [Ref 2,3,4] the existence and uniqueness of the optimal solution was investigated. The author completes these papers by the present note in which it is shown that under certain assumptions the optimal solution depends continuously on the initial conditions and on the parameters (consequently the problem is given correctly).
                There are 7 Soviet references.

ASSOCIATION:Ural'skiy politekhnicheskiy institut imeni S.M.Kirova (Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: January 24, 1958

Card 1/1

S/864/60/000/000/001/005
E032/E314

AUTHOR: Kirillova, F. M.

TITLE: On the existence of an optimum control of a linear
            system with random perturbations

SOURCE: Nauchnaya konferentsiya po teoreticheskim i prikladnym
            voprosam matematiki i mekhaniki, Tomsk, 1960. Doklady.
            Tomsk, 1960. 20 - 22

TEXT: Assuming that a sufficiently complete statistical
characteristic is available for the random perturbation, it is
shown that it is possible to choose a form of the control "signal"
so that the transient process will be damped out at a maximum rate.
It is assumed that the system to be controlled may be described by

$$\frac{dx}{dt} = Ax + Cn(t) + bu(t) \tag{1}$$

where $c = (c_1, \ldots c_n)$, $b = (b_1, \ldots b_n)$ are constant vectors
in the phase space, A is an $(n \times n)$ matrix whose elements are
constants and $u(t)$ is a piece-wise continuous manipulated variable
Card 1/3

On the existence of ....

subject to the condition

$$|u(\tau)| \leqslant 1 \ , \quad 0 \leqslant \tau \leqslant t \qquad (2) \ .$$

It is shown that at least one optimum control function exists provided 1) the vectors b, Ab, ..., $A^{n-1}b$ are non-colinear and 2) whatever the realisation $g(\tau)$ of the function $n(\tau)$, there exists a positive number a and a sequence $t_g^{(k)}$, k = 1, 2, ..., for which

$$\bigwedge (\ell(t_g^{(k)}), \ t_g^{(k)}) \geqslant 1 + \alpha$$

where the numbers $t_g^{(k)}$ satisfy the conditions

$$\lim t_g^{(k)} = +\infty \quad \text{when} \quad k \to \infty, \quad \left| t_g^{(k)} - t_g^{(k-1)} \right| \leqslant M_1, \quad t_g^{(1)} \geqslant M_2$$

and M_1 and M_2 are constants independent of $g(\tau)$.
The function $\bigwedge$ is defined by

Card 2/3

On the existence of ....

S/864/60/000/000/001/005
E032/E314

$$\Lambda(\ell(t),t) = \min \left| \int_0^t |(\ell F(t-\tau)b)| \, d\tau \right. \quad \text{where}$$

$$(\ell \int_0^t F(t-\tau)cg(\tau)d\tau) = -1 \quad .$$

ASSOCIATION: Ural'skiy politekhnicheskiy institut
(Ural Polytechnical Institute)

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82047

S/040/60/024/02/11/032

AUTHOR: Kirillova, F. M. (Sverdlovsk)

TITLE: On the Limit Passage in the Solution of a Problem of Optimum Controls

PERIODICAL: Prikladnaya matematika i mekhanika, 1960, Vol. 24, No. 2,
            pp. 277-282

TEXT: Let the control be described by the equation

$$(1.1) \qquad \frac{dx}{dt} = A(t)x + b(t)\, u\,(t),$$

where $x = \{ x_1(t), \ldots x_m(t) \}$

is the image vector in the phase space, the elements $a_{ik}(t)$ of the matrix $A(t)$ and the components $b_i(t)$ of the vector $b(t)$ are continuous functions. The optimization problem consists in the determination of a control function $u(t)$ such that the point x arrives in the shortest time at the origin of coordinates from the initial position $x(t_0) = x_0$. In addition it is demanded that $u(t)$ is determined in the class of those functions for which

$$(1.2) \qquad \int_{t_0}^{t} |u(\tau)|^p\, d\tau \leq 1 \qquad (p > 1)$$

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80247
S/040/60/024/02/11/032

On the Limit Passage in the Solution of a Problem of Optimum Controls

The author shows that the sought optimum control function $u(t,p)$ is a continuous function which for $p \rightarrow \infty$ with respect to the measure tends to the solution $u(t)$ of the optimization problem for (1.1) under the restriction

$$(1.3) \qquad |u(\tau)| \le 1, \qquad t_0 \le \tau \le t \quad .$$

Furthermore she states that the optimum process duration $T(p)$ of the problem (1.1) - (1.2) for $p \rightarrow \infty$ tends to the optimum process duration T of the problem (1.1) - (1.3). The results open the possibility of solving the problem (1.1) - (1.3) approximately by reducing it to the problem (1.1) - (1.2) which can be solved with the aid of the calculus of variations.
There are 10 Soviet references.

SUBMITTED: March 23, 1959

Card 2/2

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AUTHOR: Kirillova, F.M.

TITLE: On the problem of the existence of optimal trajectories of nonlinear systems

PERIODICAL: Izvestiya vysshik uchebnykh zavedeniy. Matematika, no.2, 1961, 41-53

TEXT: The author proves an existence theorem of the theory of nonlinear optimal control.
Given the system

$$\frac{dx}{dt} = f(x,t) + B(t)u(t), \tag{1.1}$$

where the elements $b_{ij}(t)$ of the matrix $B(t)$ are continuous, the control $u(t) = (u_1(t), \ldots, u_r(t))$ is piecewise continuous,

$$\max |u_j(t)| \leq N, \qquad j=1,\ldots,r, \tag{1.2}$$

the function $f(x,t) = (f_1(x_1,\ldots,x_n,t), \ldots, f_n(x_1,\ldots,x_n,t))$ is continuous in t and has continuous bounded derivatives $\frac{\partial f_i}{\partial x_j}$ $(|\frac{\partial f_i}{\partial x_j}| \leq L)$, $f(0,t) = 0$.

In the moment t_0 let the image point have the coordinates $x(t_0) = x_0$;
Card 1/6

On the problem of the existence...   S/140/61/000/002/002/009
                                            C111/C222

u(t) shall be chosen so that the image point reaches the coordinate
origin in a shortest time T.

Let exist a sequence of controls $u^{(k)}(t)$ of (1.1), where the
corresponding trajectories $x(x_0,t_0,u^{(k)}(t),t)$ satisfy the condition

$$x(x_0,t_0,u^{(k)}(t), t_0+T_k) = 0 \qquad k=1,2,\dots,$$

where $T_k > T_{k+1}$, $\lim_{k\to\infty} T_k = T > 0$; let the $u^{(k)}(t)$ satisfy (1.2). Let
exist no control u(t) which satisfies (1.2) and $x(x_0,t_0,u(t),t_0+\Theta) = 0$
for $\Theta < T$. Such a sequence $u_k(t)$ is called a minimizing sequence.

Lemma 1.1: If $u^{(1)}(t)$, $u^{(2)}(t)$, $t_0 \le t < \tau$ are controls of (1.1) then for
the corresponding solutions $x^{(1)}(t) = x(x_0,t_0,u^{(1)}(t),t)$, $x^{(2)}(t) =$
$= x(x_0,t_0,u^{(2)}(t),t)$ there holds the estimation

$$\sum_{i=1}^{n} |x_i^{(1)}(t)-x_i^{(2)}(t)| \le rnM \int_{t_0}^{\tau} \sum_{i=1}^{r} |u_j^{(1)}(t)-u_j^{(2)}(t)| dt\, e^{hL(t-t_0)},$$

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